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PLANT INDUSTRY

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BUREAU OF PLANT INDUSTRY

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REPORT FOR THE MONTH OF JANUARY, 1934.

JUDITH BASIN:

January weather was unusually warm and mild. The mean temperature was 32° as compared with the record high mean of 33° in 1919 and 32° in 1931. There was very little wind during the month, and soil blowing was not serious. However, all fallow is now in an ideal condition to start drifting should high winds occur without snow. Winter rye has greened up within the past few days, and winter wheat is beginning to show green again. Weeds of the winter annual type, such as fan weed and some of the wild mustards, are also beginning to grow. A few grasshoppers have been reported in nearby localities, but these are undoubtedly those that have survived from last fall. Maximum temperature, 57°; minimum, -8°; precipitation, 0.28 inch.

HUNTLEY:

Weather during practically the whole month of January was unusually mild and open. On New Years day a minimum temperature of -2° was the low point of the month and was 13° below the next highest reading. Thawing took place every day but one. Two snow flurries and two light showers were received during the month. Wind movement was high on a few days, but so far no soil drifting of a serious nature has occurred locally. Winter wheat and rye sown early on well prepared seed beds appear to be in good condition, but where these crops were sown late or on poor seedbeds they do not look very promising. Continued exposure to varying temperatures and drying winds have worked a hardship on these poorly established plantings. It has been possible to let livestock run out during the entire month, and where any sort of pasture was available the feeding of hay was reduced accordingly. There is very little frost in the ground, and fencing, ditching, and gravelling crews of the various C.W.A. projects at the station have not been delayed on account of that factor which ordinarily would be quite a hindrance at this season.

Maximum temperature, 61°; minimum, -2°; precipitation, 0.33 inch.

SHERIDAN:

The past month was the warmest January recorded at the station. The past week especially was warm. The mean temperature for the month was 1° over the previous high recorded in 1919. Snow on the ground the first of the month melted quite gradually, and with what little fell during the month, has only just disappeared. Except where the snow drifted some, the surface of the ground is quite dry. Wind movement for the month just equalled the station average for the month from 1917 to 1932. High wind on a few occasions caused some soil blowing on light soil. Apparently the month was unfavorable for fall sown crops. Buds have swelled noticeably on much shelterbelt stock and shrubbery. For wintering livestock these conditions were quite favorable, as a minimum of feeding was required. Maximum temperature, 58°; minimum, 5°; mean, 30°; precipitation, 0.15 inch.

MANDAN:

Arboriculture - The year 1933 was distinctly unfavorable for survival of established trees and for the production of stock in tree nurseries. The prolonged drought during the latter three-fourths of the year resulted in reductions in stand of practically all the tree species under test on the station. The most notable species with reference to survival is buckthorn (*Rhamnus cathartica*). The block was set out in 1918

on the poorest site of any of the test plantings, and is the only species of those set out in the earlier years which has maintained a survival of 100 per cent. The species has never been subject to any appreciable degree of winter injury, is free of insect pests, and would appear to be a satisfactory substitute for Siberian pea-tree in localities where unfavorable soil types and heavy infestation of blister beetles prevent the Siberian pea-tree from making satisfactory progress. The possibility of buckthorn spreading crown rust of oats, however, may prevent its recommendation as one of the more important species for tree planting. The elm bark beetle infection is one of the major insect problems with station trees at the present time. A number of elm trees were killed entirely by this insect in 1933, and many more are badly weakened as a result of infection. Many species of poplar are infested with borers, which tunnel the heartwood. Trees infested with borers may live for years unless broken down by storms or damaged by other factors, whereas the bark beetles work directly under the bark in the cambium layer and quickly kill all trees infested. Blister beetles were also a serious menace in 1933. Siberian pea-tree seedlings were defoliated the entire summer. Arsenate of lead spray had very little effect as a control measure, the new growth being eaten off as fast as it appeared. Russian olive and Chinese elm were also defoliated during early July. Nursery tree stock made practically no growth during 1933. American and Chinese elm seed failed to germinate. Seedlings of several other species remained stagnant after the end of June. Evergreen seedlings set out in the transplant field were practically a complete failure. The stock available for distribution in 1934 is considerably below average in both quality and numbers.

Cooperative tree plantings set out on farms the spring of 1933 showed survivals at the end of the first growing season as follows:

Hardwoods	Per cent	Conifers	Per cent
Northwest poplar	79.9	Black Hills spruce	18.2
Boxelder	85.4	Scotch pine	2.6
Green ash	77.5	Western Yellow pine	4.1
Siberian pea-tree	78.9		
Russian olive	77.7	Average	11.7
Chokecherry	73.7		
Chinese elm	76.4		
Buffaloberry	36.6		
Average	78.1		

Reports and collected data show the young trees were subjected to severe damage by drought, grasshoppers, and blister beetles. Siberian pea-tree was defoliated the entire summer by blister beetles, resulting in many of the trees going into the winter in a very weak condition. Other species were defoliated at various times by beetles and hoppers, and many of the trees were badly "barked" by the latter insect. Conifers, over most of the area, gave good stands until late summer, and then rapidly died out. The shipping of evergreen stock at the commencement of the shipping season, (April 1), when weather conditions are usually favorable for planting and establishment, will be practiced in the future instead of shipping at the close of the season (May 1) when the rainy season has passed and hot weather and drying winds can be expected. Growth and survival data were collected from all 5- 10- and 15-year shelter belts in Wyoming and South Dakota, and for a few plantings in North Dakota. The following are the average heights in feet and the percentage survivals for the various species in the respective States:

5-year	Northwest poplar		Boxelder		Green ash		Siberian pea-tree		Chinese elm		Willow	
	Ht.	Stand	Ht.	Stand	Ht.	Stand	Ht.	Stand	Ht.	Stand	Ht.	Stand
N.Dak.	9.2	78.2	7.4	93.9	6.9	88.7	3.6	80.9	7.0	100.0	-	-
S.Dak.	9.0	85.5	7.4	91.7	5.6	93.3	3.8	82.4	10.8	100.0	-	-
Wyo.	9.0	59.0	9.3	100.0	7.4	100.0	5.9	100.0	11.0	100.0	-	-
10-year												
N.Dak.	19.3	100.0	13.9	100.0	12.0	57.1	5.4	93.5	-	-	-	-
S.Dak.	22.7	26.6	12.4	58.8	8.9	78.5	6.3	80.2	-	-	-	-
Wyo.	20.0	16.4	8.8	65.9	9.2	88.5	7.1	97.6	-	-	-	-
15-year												
N.Dak.	-	-	17.0	77.2	16.4	89.3	-	-	-	-	4.3	26.0
S.Dak.	-	-	13.0	100.0	12.2	73.0	-	-	-	-	13.3	1.6

The small percentage of plantings visited in North Dakota probably prevents the data from being representative of the total number of plantings of that particular age in the State.

All plantings in Wyoming were found to be in comparatively good condition and forming effective shelter belts, even though certain species had killed out in part. A very different condition was found in South Dakota where all trees were entirely defoliated and very badly "barked" by a combination of blister beetles and grasshoppers. Green ash were found to be severely infested with borers over most of South Dakota. This infestation has now reached a point where it seems useless to plant more ash trees until such times that practical control measures can be worked out, or until the appearance of natural parasites in sufficient numbers to prevent further serious damage. Natural parasites were observed in two tree plantings. A few private plantings of honeylocust and hackberry were found in South Dakota in which the trees appeared to have suffered less drought and insect injury than some of the more generally considered hardier trees. It would appear that these two species can well be tested throughout western South Dakota as a substitute for green ash. The following table gives the total numbers of farm shelter belts by States, which have been planted in cooperation with the Mandan Station, and the number and percentage which are still surviving and rendering effective protection in a satisfactory manner in addition to making a permanent improvement in the farm home.

	Montana	N. Dak.	S.Dak.	Wyo.	Total
Number shelter belts planted	1648	1147	725	321	3841
Number surviving	1111	963	618	269	2961
Percentage surviving	67	83	85	83	77

The year 1933 offered many opportunities for comparison of the drought resisting abilities of the different conifer species which are generally recommended for this region. Western yellow or ponderosa pine is outstanding in its ability to thrive under adverse moisture conditions. Scotch pine, which has generally been considered absolutely hardy in the past, suffered both killing back of leader growth and losses in stand. White, Black Hills, and Colorado blue spruce are now rapidly turning brown and dying as a result of the drought. The losses in spruce are confined chiefly to trees in border rows with a south and west exposure. A hardiness rating on evergreens at the present time, would undoubtedly place Western Yellow pine at the head of the list, followed by redcedar, the three spruces, Scotch, Norway, and jack pine.

BELLE FOURCHE:

January was dry and unseasonably warm. The mean temperature for the month was 28°. This is 11° above normal and next to the highest on record for January. Mild weather prevailed consistently throughout most of the month, the temperature rising above freezing on 24 days and falling

below zero only once. A rain of 0.25 inch occurred January 2 and 3, but otherwise no precipitation of any value was received. The wind movement was exceptionally low and the wind did not become strong enough at any time to cause soil blowing. The continued dry weather has been unfavorable to winter wheat, and it is doubtful if much of the grain that germinated in the fall will survive. The annual lamb feeders day and dinner was held at the station on February 5. The attendance numbered slightly over 100, and unusual interest was evidenced in the station lambs and the results obtained in the feeding tests.

Maximum temperature, 61°; minimum, -1°; precipitation, 0.29 inch.

ARCHER:

During January the weather was mild and dry with high winds at times. However, to date, the winter cereals have not been damaged by soil blowing. The snow fall was not sufficient at any time to prevent grazing. The mild, open weather has been of great aid to the cattle industry, in that it has made possible the conservation of feed. Winter cereals seeded on fallow and corn ground are in good condition. Seedings on land which had been seeded to drilled crops in 1933 are in very poor shape. The mild weather has been favorable for C.W.A. State projects which occupied most of the time during January.

Maximum temperature, 62°; minimum, 6°; precipitation, 0.03 inch.

NORTH PLATTE:

January was one of the mildest on record in this section. The mean temperature of 34° was 10.9° above normal and has been equalled only once in 60 years. The absolute minimum was 10°, which is 45° above the low record for January. The maximum of 64° is 6° below the high record for the month. Precipitation was 0.05 inch. There were a few days of strong wind but no storms. The month closed with no snow on the ground and with the soil almost frost free. Tree buds are beginning to swell, and continuance of the present mild weather is apt to cause sufficient growth so that low temperatures later will cause injury. Continued dry weather and no snow protection is unfavorable for fall seeded grain, but killing out has been slight to date.

AKRON:

January was a continuation of the mild, clear, and free from wind weather experienced during the first half of the winter. The weather has been nearly ideal for outdoor winter jobs, and the C.W.A. projects have been continued without interruption.

Maximum temperature, 65°; minimum, 10°; precipitation, 0.02 inch.

COLBY:

January was very warm and pleasant with very few windy days. It was also dry. Most of the time the ground has not been frozen. The minimum temperature has, however, been below freezing every night. Winter wheat continues to hold its own. That which did not come up in the fall has come up here and there during the month. That which was up has been growing some during the month. Rabbits are eating off some of the growth on the plots. There has been no noticeable soil blowing, except a little on the 12th. Maximum temperature, 66°; minimum, 9°; precipitation, 0.06 inch.

HAYS:

January has been a mild month with a mean temperature of 36.2° above normal. There have been but few cloudy days and not more than four days of disagreeable wind. Although there has been some frost in the ground and some ice in the creek most of the time, there have been only three or four days during the entire month when outside work could not be done with comfort. The subsurface soil remains in good condition with sufficient moisture to maintain normal plant life for some time. Winter wheat on fallowed plots and on early fall prepared plots is in excellent condition. On fallow the growth covers about 50 per cent of the ground, and on cropped land prepared early it covers from 25 per cent to 35 per cent of the ground. On corn stubble plots the stand as result of early germination is very spotted. The stand varies from 35 per cent on some plots to 65 per cent on other plots. The growth on this portion of the corn stubble plots is as good as the growth on the early prepared plots, but a good portion of the wheat that germinated late has made considerable growth just underneath a light crust of soil which it has been unable to break through. This crust is very thin and crumbles so easily it seems strange that the wheat has been unable to come through. About 75 per cent of the wheat sown on very late prepared plots, on stubbled-in plots, and on sorghum stubble plots is still under the crust like that described on portions of the corn stubble plots. The mild weather has encouraged the swelling of buds on elm and other trees and shrubs and also on grapevines. Tulips are up and in some localities buffalo grass is getting green.

Maximum temperature, 70°; minimum, 9°; precipitation, 0.29 inch.

TUCUMCARI:

January was warm, dry, and calm. The mean temperature, 40°, was somewhat above the long-time mean, but more striking was the fact that no temperature of the month fell below 10°. With only a trace of precipitation this month, following December with no precipitation, soil is very dry. Fields have been worked to prevent soil movement, but to date there have been only two days when bare, unworked plots would have blown. Farmers report little change in the condition of wheat in the southern part of the county. Precipitation since August 31 totals only 1.37 inches, with unusually warm weather throughout the period. It seems remarkable that any considerable amount of wheat can still exist under such conditions. During 1933 the total precipitation of 16.50 inches would have been roughly divided into two parts: - a wet period during July and August, when 12.05 inches was received; and the remaining 10 months which received only 4.45 inches. Crop yields were in most instances above the long-time average. Yields, 1933, compared with long-time averages:

Crop	Long-time average	1933 average	1933 high yield	1933 low yield
Milo	27.2 bushels	27.1 bushels	58.6 bushels	11.4 bushels
Kafir	19.9 "	21.1 "	31.2 "	14.5 "
Corn	16.0 "	17.0 "	25.0 "	13.9 "
Sorgo(cured total)	6246 pounds	7910 pounds	11,560 pounds	5100 pounds
Cowpea hay	2064 "	2541 "	4750 "	1570 "
Broomcorn (brush)	409 "	669 "		
Cotton lint	122 "	188 "		
Pinto beans	6.4 bushels	8.0 bushels		
Sudan hay	3765 pounds	3200 pounds		

Maximum temperature, 70°; minimum, 10°.

DALHART:

The mild weather of January permitted outside work throughout the month. Soil blowing was especially severe on two days and less bothersome on parts of other days. So far this winter the station fields have not blown badly. The field north of the station is now in excellent blow condition and may start moving if the drought and high winds continue. Late seeding of winter wheat and winter rye continues to grow. There is sufficient cover of rye on the vineyard and tree plantings to hold the soil except for a few spots. The early seeding of winter rye has exhausted the soil moisture. The three-fourths of a mile of 5-foot picket fence along the south and west of the station continues to check the soil from blowing onto experimental plots.

Maximum temperature, 69°; minimum, 11°; precipitation, trace.

BIG SPRING:

Weather conditions during the past month have been dry with moderate temperatures prevailing most of the time. A minimum of 20° was recorded on two occasions, and the rest of the time it seldom got below freezing. Twenty-five acres of Sumac was stacked for the cattle feeding work, and considerable winter plowing has been done during the month. The winter listed plots were also prepared. Other work has consisted of ginning cotton and pruning shrubs and hedges.

Maximum temperature, 77°; minimum, 20°; precipitation, 0.33 inch.

LAWTON:

Very mild temperatures, the absence of wintry storms, and an average amount of precipitation characterize the month of January in southwestern Oklahoma. The temperatures ranged from a minimum of 16° to a maximum of 75°, and the monthly mean temperature was 4° above normal. Precipitation, recorded on four dates, amounted to 1.17 inches, exceeding the long time monthly average by only 0.09 inch. The soil is well supplied with moisture, and small grains are in good winter condition, most of them supplying a limited amount of grazing. Station plots of wheat are well tillered. Most of the farmers have used the good weather to advantage in preparing for comparatively early seeding of oats. However, January seedings in 1933 were so universally killed by severe freezes that most of the 1934 oats crop will be seeded in February. Mild winter weather has again held trees and shrubs in a semi-dormant condition that is conducive to injury by late spring freezes.

WOODWARD:

Temperatures over the past month have been mild, and there have been no high winds. A wet snow totaling nearly an inch of precipitation fell the first week and lay on the ground until nearly the middle of the month. This protected the wheat and gave it some moisture to live on. While much of the wheat went in on dry land last fall, little of it has died, though much of it has made little growth. On better prepared land where there was plenty of moisture wheat made a rampant growth during early fall and later many of leaves died. But it is deeply rooted and in excellent condition at present. Hairy winter vetch has made excellent growth and shows no drought or winter injury. This seems especially well adapted to very sandy soil. Some of it was planted among sagebrush on a neighboring sandhills ranch. It made a good start, but cattle have kept it very closely grazed. Normally it volunteers until in wheat land it may become considerable of a pest. On sandy pasture land it is hoped that it may propagate itself until it is an asset. Buds of Chinese elm,

peaches, and a number of the ornamentals are swelling and will probably be killed by late freezes, as usual.

Maximum temperature, 74°; minimum, 6°; precipitation, 0.83 inch.

PENDLETON:

January temperatures were very mild, the finest winter weather in many years according to long time residents. The lowest temperature during January was 25°, with temperatures of 32° or less on 12 days. The highest temperature was 62°. Precipitation for the month was 1.52 inches or 0.20 inch less than normal. A measurable amount of precipitation fell on 14 days. The soil is well supplied with moisture to a depth of 6 feet. This section has had little or no run-off from the fields and no cutting of small ditches on the steeper lands. In the Palouse section of eastern Washington the damage from erosion is the most severe in years. Very little actual field work was done this month, the rotation and tillage fallow were cultivated with the spring-tooth on the 30th. The fall plowed plots were spring-toothed on the 31st. The Reeves spirea on the station did not lose their leaves this year and are now sending forth new leaves. The writer attended a conference of all the branch station superintendents, county agents, and extension workers in Corvallis on January 9 - 13.

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